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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,961	12/03/2001	John D. Holder	MEMC 00-1100 (2808.1)	7824

321 7590 02/25/2004

SENNIGER POWERS LEAVITT AND ROEDEL  
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ST LOUIS, MO 63102

EXAMINER
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ANDERSON, MATTHEW A

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/004,961	HOLDER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Matthew A. Anderson	1765	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 51 and 52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-50 and 53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/12/02; 4/01/03</u> . | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

### *Election/Restrictions*

1. Claims 51 and 52 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 12053.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-50, 53 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21, 29-30 of U.S. Patent No. 5,795,381 in view of Wolf et al., *Silicon Processing for the VLSI Era*, Volume 1: Process Technology, Lattice Press, Sunset Beach, CA, USA, pp. 1-108, 1986.

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Claims 1-21, 29-30 disclose a method for transferring a sample of the gaseous environment from a growth chamber in which a single crystal Si ingot was being grown to a detector, analyzing the sample to determine the concentration of a contaminant in the atmosphere, using the concentration to determine and control at least one process parameter based on the contaminant gas concentration.

The claims do not require the pressure in the apparatus to be sub-atmospheric.

Wolf et al. discloses on page 18 the need to keep reactive gases out of the pulling chamber and the use of an inert purge gas flow to sweep such gases from the growth chamber. The growth chamber is sealed as shown in page 17. Growth at a reduced pressure (i.e. one that is sub-atmospheric) was known to reduce oxygen content in the ingot. Wolf et al. also suggests limiting the incorporation of atmospheric gases into the melt during growth by pumping out the chamber and backfilling with an inert gas in a purge as an ordinary step in the ingot pulling method (page 9). Page 101-105 detail the use of residual gas analyzers (RGA's). RGA's are mass analyzers useable at high vacuum (page 101). Common gases suggested as analyzed by Wolf et al. in pulling environments include N and CO (page 103), as well as H<sub>2</sub>O on page 104.

In respect to claims 1-2 and 53, it would have been obvious to one of ordinary skill in the art at the time of the present invention to combine the sub-atmospheric pressure of Wolf et al. with the method of the patent since the patented claims include control of oxygen content in the ingot grown.

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In respect to claims 1 and 53, it would have been obvious to one of ordinary skill in the art at the time of the present invention to perform the patented claim at sub-atmospheric pressure because this would allow for oxygen content to be controlled in the product ingot as per the claims.

In respect to claim 2, it would have been obvious to one of ordinary skill in the art at the time of the present invention to analyze for the contaminant gas of CO or nitrogen or water vapor because Wolf et al. discloses these as common gases to analyze for in pulling system atmospheres.

In respect to claims 3-50, it would have been obvious to one of ordinary skill in the art at the time of the present invention to perform gas atmosphere analysis in a pulling apparatus by RGA because such was suggested by Wolf et al.

In respect to claims 3, 9, 10, 14, 15, 19, 20, 29, 30, 31, 40-42, 46-50, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the result effective variables of scan time (interval between analysis) because such near real time was achieved in the patent and such analysis would allow quick responsive control and process monitoring.

In respect to claims 4, 32, 43 it would have been obvious to one of ordinary skill in the art at the time of the present invention to use a RGA mass analyzer for the analysis in the patented claims because Wolf et al. suggests the RGA as effective in such ingot pulling systems.

In respect to claims 5-6, 33-34, 44-45, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the carbon

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concentration and diameter of the pulled ingot since the claimed values were known to Wolf et al. to be result effective parameters.

In respect to claims 7, 12, 17, 22-23, 35, it would have been obvious to one of ordinary skill in the art at the time of the present invention to analyze the chamber for leaks prior to forming the molten mass for pulling in the chamber and to analyze the exhaust gases because this would allow for quality control processes by establishing a baseline atmosphere as well as ensuring contaminants were being pulled from the system.

In respect to claims 8, 13, 18, 25-28, 36-39, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the result effective parameter of gas concentration because the patent suggests gas analysis and control from that analysis and Wolf et al. suggests analysis for the specific atmospheric gases.

In respect to claims 11, 16, 21, 24, it would have been obvious to one of ordinary skill in the art at the time of the present invention to collect a sample from above or adjacent to the melt surface because this is suggested in the patented claims.

In respect to claims 12, it would have been obvious to one of ordinary skill in the art at the time of the present invention to analyze a sample of the exhaust gas from the chamber because

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Anderson whose telephone number is (571) 272-1459. The examiner can normally be reached on M-Th, 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAA  
February 11, 2004

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**

